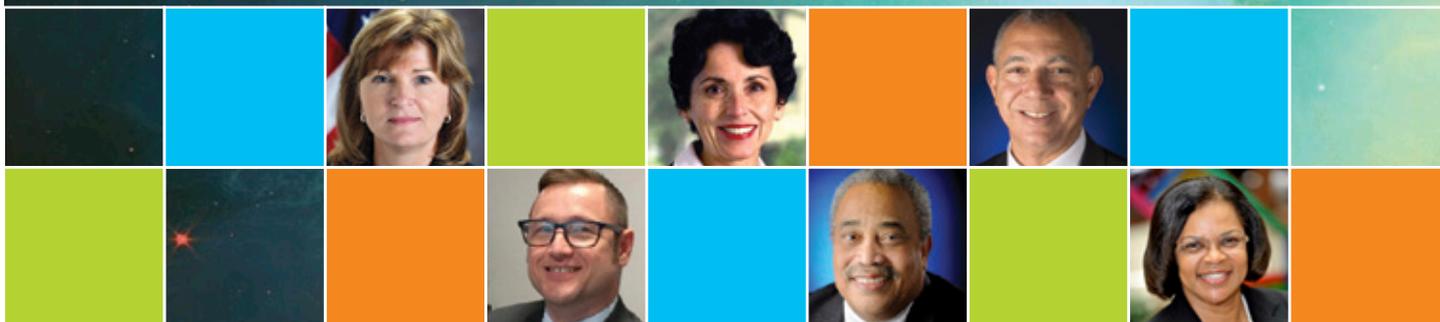




Promising Practices for Equal Opportunity, Diversity, and Inclusion in STEM: The First NASA MissionSTEM Summit and Beyond



DECEMBER 2016

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Acknowledgments

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FRONT COVER

Row One (Left to Right): Christina M. "Tina" Tchen, Assistant to the President and Chief of Staff to the First Lady; Charles F. Bolden, Jr., Administrator; Dr. Dava J. Newman, Deputy Administrator; Robert M. Lightfoot, Jr., Associate Administrator

Row Two (Left to Right): Dr. Ellen Stofan, NASA Chief Scientist; Dr. Jo Handelsman, Associate Director for Science at the White House Office of Science and Technology Policy; Brenda R. Manuel, Associate Administrator for Diversity and Equal Opportunity

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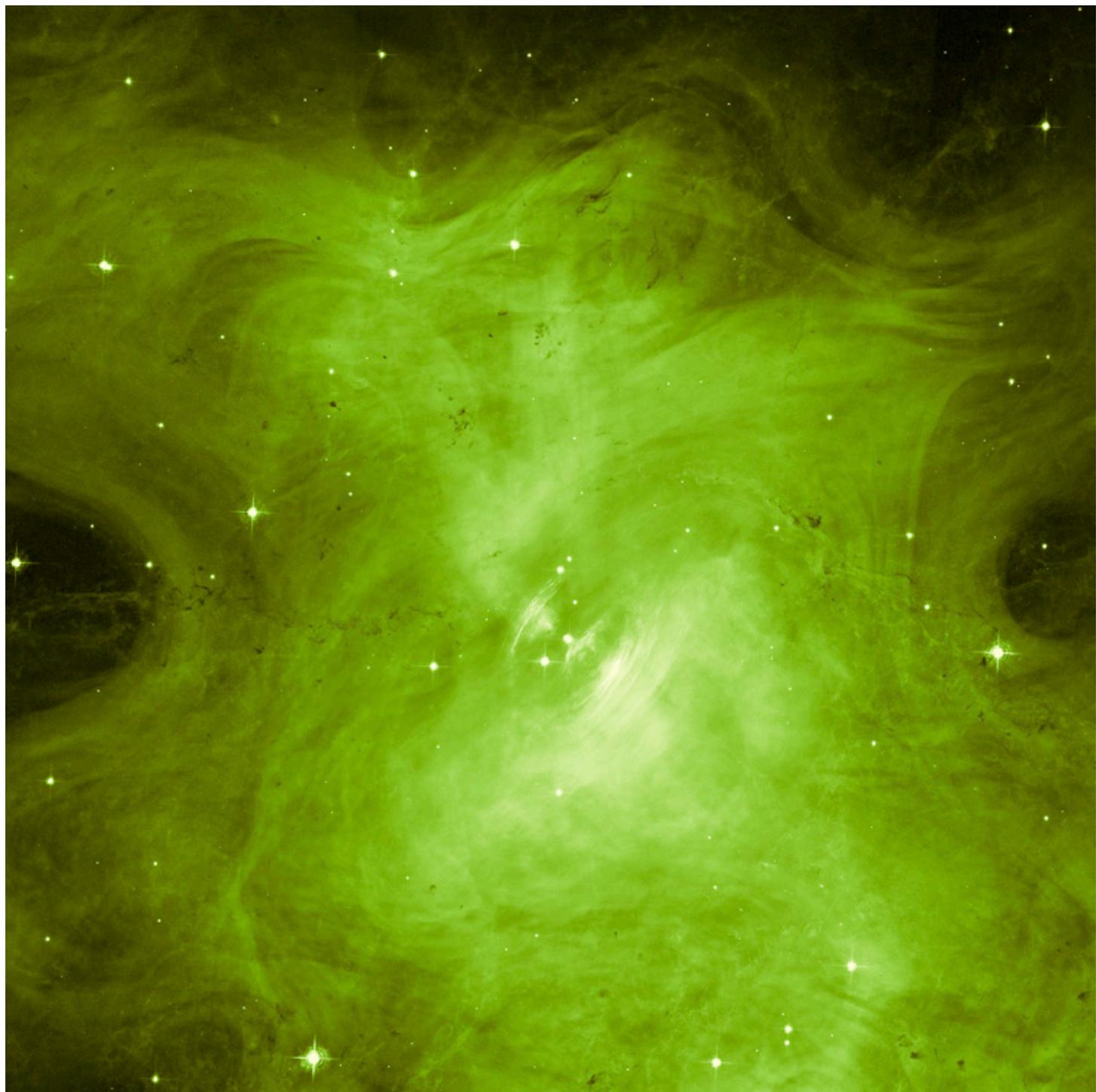
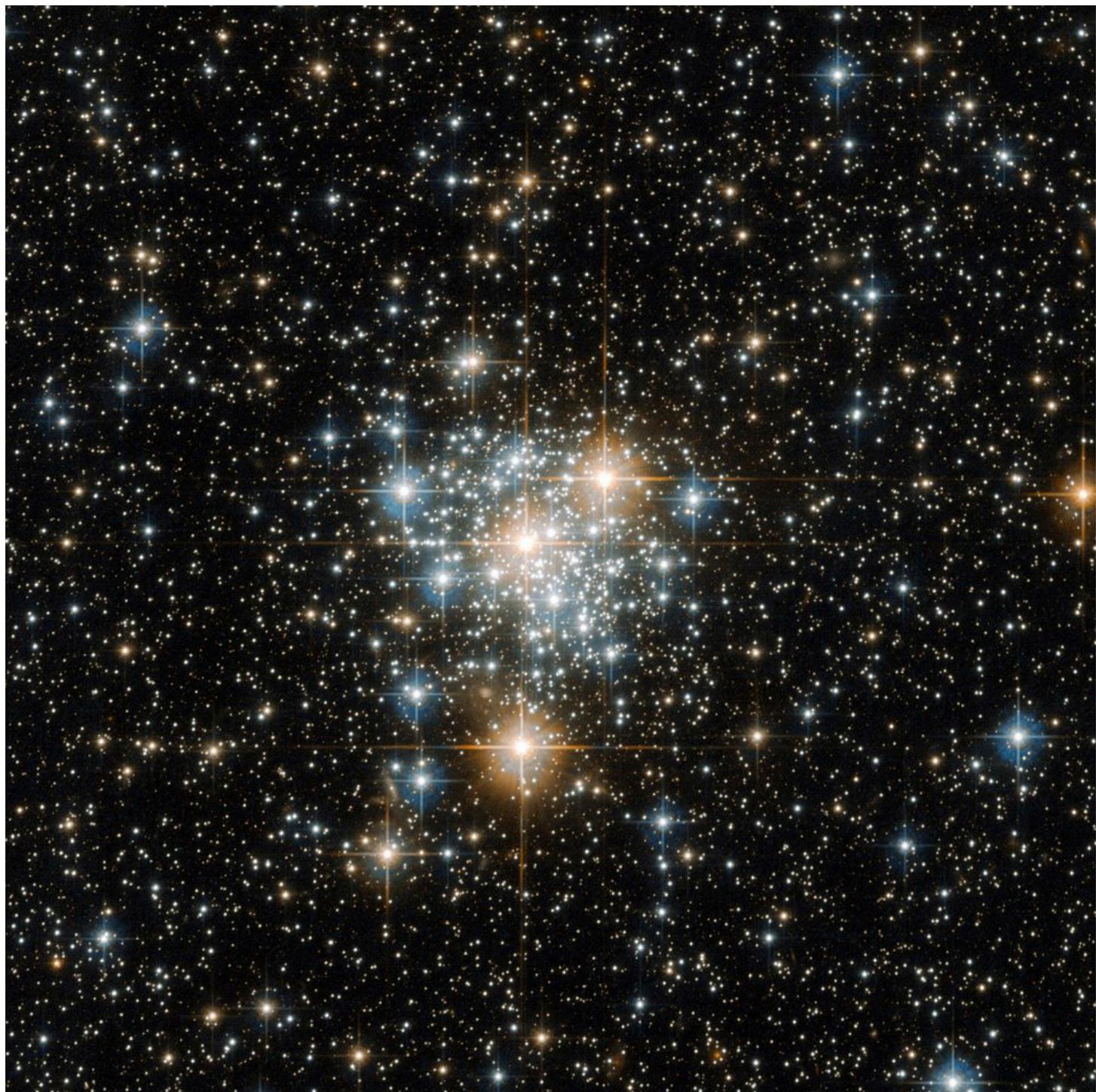


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Introduction

NASA held its first MissionSTEM Summit on August 8–9, 2016. The Summit was a natural progression toward reaching the goals of the MissionSTEM Web site, which was created to provide civil rights and equal opportunity (EO) technical assistance to the Agency's approximately 750 grantee institutions nationwide. Each grantee, as a recipient of Federal dollars, has the responsibility of ensuring its beneficiaries, such as students in science, technology, engineering, and mathematics (STEM) programs, and visitors to science museums, have an equal opportunity to participate and succeed in these programs, regardless of race, ethnicity, gender, disability, or age. NASA sought, through the Summit, to further civil rights compliance with the law among its grantees and to address issues of EO and diversity and inclusion (D&I) in STEM professional and academic settings.

In keeping with these goals, the Summit brought together representatives and students from grantee institutions, federal and grantee civil rights compliance officials, and other experts from government, academia, industry and professional organizations. As a measure of NASA's commitment to D&I in the STEM enterprise Nation-wide, senior Agency leadership actively participated in the event, including the Administrator, Deputy Administrator, Associate Administrator and executive leaders from across the full spectrum of the Agency's activities, from science, aeronautics, and human space exploration, to administrative professional fields, such as education, small business, and human resources.

The Summit served multiple purposes relating to the Agency's mission, including:

- Creating a forum in which to communicate NASA's future workforce needs;
- Helping federally funded STEM education programs address current civil rights issues in academic environments, such as sexual harassment, implicit bias, and non-inclusive climates;
- Assisting minority serving institutions in increasing participation in NASA business and grant opportunities, and education programs; and
- Sharing promising and emerging practices to help increase underrepresented and underserved populations at NASA and in STEM education and professions

As a follow-on to the Summit, we seek to share those practices that emerged from the two-day event, as well as a non-exhaustive compilation of those culled from recent NASA civil rights compliance reviews of our grantees (2012–2016). The practices gathered here are intended to address EO regardless of race, ethnicity, gender, disability, or age, as well as D&I in STEM educational programs, both formal and informal, funded by NASA.

These practices reflect the components of a well-functioning environment as identified in NASA's Title IX Self-Evaluation Guide (http://odeo.hq.nasa.gov/documents/TITLE_IX_STEM_Self-Evaluation_Fillable.pdf), including admission of beneficiaries, such as STEM students or museum visitors, their treatment in the program, and recruitment and treatment of staff, such as faculty or administrative staff. While we are concerned with all of the protected bases, NASA's Self-Evaluation Guidance for grantees seeks to evaluate their efforts under Title IX, which prohibits sex discrimination in federally funded educational programs. Although the Title IX self-evaluation requirement is focused on sex or gender, it is nonetheless instructive for all bases because it provides a foundation for addressing EO and D&I in STEM education. The Self-Evaluation Guide, consistent with regulations, focuses on the three areas referenced above. A key message for all grantees is that ongoing, in-depth program self-evaluation is necessary to successfully advance EO and promote D&I. Also, the practices are identified by the broad topical area each addresses, for example, soliciting student feedback, or addressing underrepresentation through bias mitigation. This is intended to assist the reader in directing his or her attention to those practices that are of greatest interest.

Above all, this Promising Practices Guide, as a follow-on to the Summit, is about furthering efforts to provide our grantees with information pertaining to our shared objectives for greater diversity, inclusion, excellence and innovation in the STEM fields. Indeed, diversity and inclusion can and must go hand-in-hand with excellence and innovation. These practices, along with many others, are accessible via NASA's MissionSTEM Web site at <http://missionstem.nasa.gov>. We specifically invite you to view the Featured Promising Practices at <http://missionstem.nasa.gov/featured-promising-practices.html>, and the 2016 Summit page at <http://missionstem.nasa.gov/MissionSTEM-Summit-2016.html>.

It is our hope that grantees will continue to utilize MissionSTEM as a central repository as they seek idea generation for efforts to make their STEM programs more diverse and innovative. A few examples of specific strategic actions grantees may wish to take in this regard include:

- Submitting their own promising practices on the MissionSTEM site;
- Contacting the people listed with each promising practice for further information and/or access the provided links; and
- Asking the NASA ODEO team for information about the compliance process not readily available on the MissionSTEM Web site (contact information is accessible at <http://missionstem.nasa.gov/contact-us.html>).



Practices from the MissionSTEM Summit

During the Summit, participants heard from a number of speakers and panelists about practices in which they and their institutions were engaging. At the close of the Summit, participants were also asked to provide examples of practices in which their institutions were engaging or sought to engage that they believed were helping to address the need for greater diversity and inclusion in STEM. The following reflect the responses received. While the practices cited are, in many cases, nationally recognized, we have associated each practice with the institution of the Summit speaker, panelist, or grantee participant that provided it, in the interest of facilitating dialogue and idea generation between and among grantees.

Western Michigan University

Cited by Andre Kline, Ph.D.

Academic Support for first-year STEM Majors: Michigan Louis Stokes Alliance for Minority Participation (MI-LSAMP). This program is led by a five-university consortium in the State of Michigan that has been working since 2006 to increase the number of underrepresented minority students who successfully complete a STEM undergraduate degree program and then either enroll in graduate studies or enter the workforce. The program has been funded during this time by two grants from the National Science Foundation (HRD 0503316 and HRD 1002528) and university funds. As a partner in the MI-LSAMP consortium, Western Michigan University (WMU) has had a major focus on student preparation and academic support as they enter their first-year STEM majors.

WMU has been offering a 4-week pre–first year program that has enrolled 20 to 25 incoming STEM students each summer, where they live on-campus and take instructional units in chemistry, math, biology, technical communication, and academic success skills. These MI-LSAMP students can then continue with additional activities throughout the academic year after enrolling at WMU, such as course content tutoring, faculty mentoring, social events, undergraduate research, and participation in one or more of the over 30 professional student societies, including National Society of Black Engineers (NSBE), Society of Women Engineers (SWE), American Institute of Chemical Engineers (AIChE), Society of Aerospace Engineers (SAE), and Society of

Manufacturing Engineers (SME), among many others. MI-LSAMP students not only get early exposure to course content before they enroll for their freshmen courses, but they are practiced in living in a university environment; learn about the expectations of university instructors for new students; and begin to build a peer-support structure or community that they can turn to during the academic year. The community is longitudinal, involving MI-LSAMP students in their freshmen through senior years and beyond to alumni.

From the Fall 2006 semester to the Fall 2015 semester, enrollment of underrepresented students in the WMU College of Engineering and Applied Sciences increased from 10.6% to 16.3% of the undergraduate student body. Bachelor's degrees awarded in the College to underrepresented students increased from 25 during the 2008–09 academic year to 48 during the 2014–15 academic year. Although no direct causal relationship can be shown to the MI-LSAMP activities, MI-LSAMP is the major focused effort in the College to improve enrollment and success of underrepresented students. To learn more visit <http://milsamp.engin.umich.edu>.

Vanderbilt University

Cited by Jedidiah Isler, Ph.D.

Conversations between Women of Color in STEM: Vanguard STEM. This online series—whose formal name is “Conversations with Women of Color in STEM,” or #VanguardSTEM for short—is a live, monthly Web series featuring a rotating panel of women of color in STEM discussing a wide variety of topics including their research interests, wisdom, advice, tips, tricks, and current events (among many other things!). It’s a lively gathering moderated by founder and host, Dr. Jedidiah Isler, with questions and input from viewers via social media. The guiding principle of the show is to create conversations between emerging and established women of color in STEM, where they can celebrate and affirm their identities and STEM interests in a safe space. The show airs the first Tuesday of every month and all archived episodes can be found on the site and on YouTube. The conversation can be joined on the VanguardSTEM site or via social media. To learn more visit <http://vanguardstem.com>.

California State University, Long Beach

Cited by Laura Kingsford

Engaging Undergraduates in Mentored Research: NIH BUILD Program. The National Institutes of Health (NIH) encourages institutions that seek to engage undergraduate students in innovative mentored research training programs to submit applications for cooperative agreement awards through the NIH Building Infrastructure Leading to Diversity (BUILD) initiative, one of three new Common Fund initiatives that together aim to enhance diversity in the biomedical, behavioral, clinical, and social sciences research workforce. Addressing a major leakage point in the research workforce pipeline, BUILD awards are intended to support the design and implementation of innovative programs, strategies and approaches to transform undergraduate research training and mentorship. BUILD awards will also support institutional and faculty development to further strengthen undergraduate research training environments. California State University is one educational institution that has availed itself of a BUILD Program grant to help get underrepresented students who have never considered pursuing doctorate degrees in the STEM fields to do so and continue with careers in health-related research, like health disparity issues. To learn more visit <https://diversityprogramconsortium.org/pages/build>.

Carthage College

Cited by Kevin M. Crosby, Ph.D.

Perry Kivolowitz

Equity Through Resource Deployment. Carthage College has begun a process of broadening its strategic focus on diversity enhancement to identify and support impactful practices around equity and inclusion. The college targets the identification of classroom and student-life efforts that have a direct and measurable impact on its ability to provide equal access and supportive environments to an increasingly diverse student body. An instructive example of a practice around equity and inclusion is the deployment of virtualized computing environments for students in computer science. The problem the college's computer science faculty identified was the disparity in personal resources that students of varying socioeconomic backgrounds bring to the computer science classroom. A student with an antiquated or partially functioning laptop computer is at

a disadvantage relative to students with modern laptops. This is a subtle but significant barrier to equity in the classroom. It was apparent that differences in student financial resources were directly related to course performance, and therefore to persistence and retention of diverse students. The college worked with campus and commercial partners to deploy a virtualized software environment for all students that allows course software to run in the cloud and display within a browser on student laptops. The result is that computing speed and time to complete assignments and activities are normalized among students of varying financial resources.

This implementation, coupled with a “laptop loan” program, means that all students now have equal access to computing resources and one more hidden barrier to equity is removed. Short-term results indicate that persistence within the computer science curriculum has improved and student engagement is no longer correlated with student financial resources. In academia, the challenges of institutional equity and inclusion are too large and complex to address within the classroom alone. Too often, the result is that identifying effective approaches becomes “someone else’s problem.” Instead, Carthage College’s focus on ground-level identification of equity barriers in the classroom and narrowly scoped solutions has proven effective in identifying and addressing a subtle but pernicious barrier to equity.

State University of New York at Cortland

Cited by Dominick Fantacone

Faculty Development Centers. One of the most promising aspects of “faculty development centers” for EO and D&I in STEM is that such centers facilitate and coordinate faculty mentoring in these arenas. They can also provide consultation services for faculty members that can help them better interface with their students, among other assistance provided. Useful aspects of faculty development services for EO and D&I are support for pedagogical innovation and research, which can help to bring more diverse student populations into STEM, and faculty learning communities, which can offer support for greater idea generation for D&I. Some NASA grant recipients currently utilizing faculty development centers are University of Maryland, Baltimore County (UMBC), San Jose State University, University of Massachusetts at Amherst, and Morehouse College, to name just a few. One MissionSTEM Summit attendee that is looking to establish a faculty development center is the State University of New York at Cortland.

University of Arizona, Tucson

Cited by Ann Weaver Hart, Ph.D., President

Improved Retention through Academic Support Services: Think Tank. The University of Arizona's (UA's) Think Tank opened its doors in 2009, offering a range of tutoring and academic support services to the University's diverse student population. Its mission is to empower UA students by providing a positive environment where they can master the skills needed to become successful lifelong learners. Think Tank is designed to make it easy and convenient for UA's students to seek help when having difficulty or concerns about a certain area covered in class or other issues, such as academic/financial standing. To this end, Think Tank has four convenient locations across the UA campus and offers among its many specialized services drop-in tutoring, academic skills tutoring, Weekly Course Reviews, Supplemental Instruction, The Writing Center, and Academic Skills Workshops. Its fee based services include individualized hour-long tutoring sessions, College Survival sessions, Exam Preps, and the Graduate Test Prep Courses (GRE, GMAT, LSAT). Courses with tutoring available to help STEM and other students include: writing and math tutoring (MATH 100-129), introductory biology, chemistry, physics, and Spanish tutoring.

Think Tank has developed strong partnerships with many academic departments and colleges, as well as other support units, on UA's campus. Those partnerships are vital to the success and vibrancy of the program. It is this collaborative process that enables UA students from all backgrounds and life experiences to learn with confidence. Also noteworthy is the vigorous training programs content tutors must go through to participate in Think Tank, including certification through an International Tutor Training Program Certification (ITTPC). Academic Skills Tutors are certified through UA's International Mentor Training Program Certification (IMTPC).

The success of Think Tank is demonstrated in increased retention rates for program participants. For the last five enrollment years, first-time full-time freshmen who made use of Think Tank services have demonstrated higher institutional retention rates (4–8% higher) than the official UA rate. When compared specifically to first-time full-time freshmen who do not utilize Think Tank services, there is a greater increase in retention (7–11%). In Academic Year 2012–2013 first-time full-time freshmen who used the Think Tank were retained at an 86.15% rate. The non-user retention rate was 77.08%.

To learn more about UA's Think Tank visit: <http://thinktank.arizona.edu>. Analytics demonstrating the impact of Think Tank on UA student success rates can be found at [http://thinktank.arizona.edu/sites/thinktank.arizona.edu/files/files/pdfs/F12 Report for Web.pdf](http://thinktank.arizona.edu/sites/thinktank.arizona.edu/files/files/pdfs/F12%20Report%20for%20Web.pdf).

Northeastern University

Cited by Richard Harris, Ph.D.

Improved Retention through Community Partnerships: Summer Bridge Program. This program was established in the College of Engineering at Northeastern University in 2002 to increase retention of underrepresented minority (URM) students. Similar to national trends in higher education, there is an attainment gap in STEM course grades, major retention, and graduation rates between ethnic minority, low-income, and first-generation college students and their white, Asian, and wealthier counterparts. These gaps in achievement present themselves among groups of students who may be from different ethnic/racial and socioeconomic backgrounds but are similarly prepared in terms of entrance exam scores and high school GPAs. This finding suggests that there are other factors impacting underrepresented students' capacity to achieve in STEM at the collegiate level. Echoing national research, the target population for Northeastern's work to broaden participation in STEM often cites feelings of isolation, lack of diverse faculty, lack of faculty involvement, poor academic advising, and unpreparedness as reasons for experiencing difficulty in STEM (Strayhorn et. al., 2013).

The Summer Bridge Program is co-hosted by College of Engineering student chapters of NSBE, Society of Hispanic Professional Engineers (SHPE), and SWE annually, in collaboration with the College of Science and College of Computer and Information Science. More than 300 underrepresented students to date have participated. These students get a one-week preview of physics, chemistry, calculus, biology, and an engineering course, to highlight the importance of creating community to combat isolation, provide students with early access to faculty for mentorship, and address an increasing need to connect students to industry partners to enhance their career readiness and growth-mindset as scientists (Harris et. al., 2012). The resulting outcome of the Summer Bridge Program is an average 90% retention rate, 85% graduation rate, and eventual 25% graduate school application rate (including but not limited to: Columbia, Johns Hopkins, UC-Berkeley, U of Florida, etc.). In 2016, specific outcomes have included: (1) a civil engineering African-American female and former NSBE Chapter President becoming the first-ever Rhodes Scholar in the 118-year history of the university; and (2) an electrical engineering NSF Graduate Research Fellow Ph.D. Candidate and UC-Berkeley Post-doc participating in the program."

The Summer Bridge Program was and is designed to mitigate the above factors by connecting students to each other and creating a sense of community to combat feelings of isolation. Providing students with early

campus exposure will enable them to identify and take advantage of campus resources early on and build relationships with faculty and staff who can support them with academic coaching to overcome any challenges that may arise (Lipman, 2004; Strayhorn et. al., 2013). To learn more, visit <http://www.northeastern.edu/uspp>.

Vanderbilt University

Cited by Jedidah Isler, Ph.D.

Inclusive Astronomy Conference and Vision Statement for Inclusive Astronomy. In July 2016, the Council of the American Astronomical Society (AAS) endorsed the vision statement that emerged from the inaugural Inclusive Astronomy conference held in Nashville, Tennessee, in June 2015. This conference included 160 astronomers, sociologists, policy makers, and community leaders who met at Vanderbilt University to discuss issues affecting people of color; lesbian, gay, bisexual, transgender, genderqueer/genderfluid, agender, intersex, queer, questioning, or asexual (LGBTIQA*) people; people with disabilities; women; people disenfranchised by their socio-economic status; and anyone in the astronomical community who holds more than one of these underrepresented identities. A key focus of the meeting was examination of issues of intersectionality: the well-established idea that racism, sexism, heterosexism, transphobia, and ableism are often linked (e.g., women of color suffer at the intersection of racism and sexism). The Vision Statement and accompanying recommendations endorsed by the AAS may be accessed at <https://docs.google.com/document/d/1JipEb7xz7kAh8SH4wsG59CHEaAJSTAWRfVA1MfYGM8/edit#heading=h.7jy6t7o9xiju>.

Northwestern University

Cited by Bruce A. Lindvall, Ph.D.

Increasing the Participation of Underrepresented Groups: GEM Program. Founded in 1976 at the University of Notre Dame, the mission of the National GEM Consortium is to enhance the Nation's human capital by increasing the participation of underrepresented groups, such as women, African Americans, American Indians, and Hispanic Americans, at the master's and doctoral levels in engineering and science programs. GEM is a network of leading corporations, government laboratories, top universities, and top research institutions that enables qualified students from underrepresented communities to pursue graduate

education in applied science and engineering. GEM has made a huge impact on the graduate student population. Northwestern University, a NASA grantee that participated in the MissionSTEM Summit, reports that GEM's Fellowship application database has enabled Northwestern to move from 36 underrepresented minority Ph.D. students to 87, in a span of less than 10 years. To learn more about GEM, visit <http://www.gemfellowship.org>.

Oregon State University

Cited by Susan M. Shaw, Ph.D.

Increasing the Participation of Women in STEM: NSF ADVANCE. Over the years, the National Science Foundation's ADVANCE grant program has helped many educational institutions nationwide increase the participation of women in academic science and engineering careers. One example of a successful ADVANCE initiative among NASA grantees is that of Oregon State University's (OSU's) endeavors under its NSF ADVANCE Institutional Transformation grant. OSU reports that the centerpiece of its ADVANCE efforts is the offering of 60-hour summer seminars for administrators and STEM faculty to explore the broader contexts of inequity and discrimination. The seminar is an interactive learning experience centered on analyzing the operations of difference, power, and privilege in higher education, with particular attention to STEM disciplines. It provides opportunities to explore structural inequities within the university and to imagine a transformed future in which institutional structures and personal behaviors are both professionally and personally life affirming for people across their differences. The goal is to help participants develop skills and tools to create a more inclusive, equitable, and just work environment. OSU is also able to provide leaders to offer seminars and train-the-trainer events at other institutions and agencies and, by the end of the project, will have the seminar available in an educational package other institutions can use to offer their own seminars. Already, after two years, more than 80 OSU faculty, staff, and administrators have taken the seminar and begun to create policies, change practices, and facilitate relationships that support the recruitment, hiring, promotion, and advancement of a more diverse faculty at the institution. OSU is also conducting extensive research on the effects of the seminar, which will be published in various professional journals toward the end of the five-year project. To learn more visit <http://advance.oregonstate.edu>.

Spelman College

Cited by Beverly Tatum, Ph.D., President Emerita

Intentional Focus on Interface with Students. There needs to be a greater focus on how and why students persist in STEM fields. What are the factors that contribute to lack of persistence for underserved or underrepresented groups? If these students have an interest in science why isn't this translating into more undergraduate and graduate degrees in STEM? Social science research suggests that critical factors include recognition of stereotype threat and the need to create a sense of belonging. Belonging uncertainty is especially prevalent for underrepresented groups, as well as performance anxiety and a fear of reinforcing stereotypes. This can be countered with better-constructed feedback. If students hear: "I see you are having some problems but I think you have a lot of potential," "I believe you can do this," and "you belong in this field" underrepresented students succeed at much higher rates, stereotype threat can be reduced, and a sense of belonging can be increased. Studies show that students, especially underrepresented students, are less likely to recommit when given the chance if they receive only criticism. There needs to be more focus on faculty development that emphasizes:

- Eliminating self-defeating behaviors in students, such as not asking for help
- Addressing the reality of unconscious bias, recognizing that it is real, and understanding what it is and how to mitigate it
- Offering micro-affirmations and other evidence-based strategies that reinforce a sense of belonging
- The need for all faculty, whether tenured or not, to understand collectively that retention is fundamental to economic success and the rapidly changing demographics of the nation must be considered.

Office of Science and Technology Policy

Cited by Jo Handelsman, Ph.D., Associate Director for Science

Making STEM More Accessible through Active Learning and Bias Mitigation. In the United States, only 60% of the students who start college intending to major in STEM graduate with degrees in STEM. Efforts to change this must be multifaceted, and attention should be focused on key areas such as the movement toward active learning in STEM study, and broad-based efforts to reduce the impact of implicit or unconscious bias. With efforts to expand active learning in STEM, promising practices have focused on diverse methods and have included: small-group discussion and peer instruction, analytical challenge before lecture, computer simulations and games, problem-based learning, problem sets in groups, and concept mapping. Focus on active learning in 1st- and 2nd-year STEM courses can result in increased retention in STEM majors, reduce the frequency of poor grades (D or F) and rate of withdrawal from college, improve higher-order thinking skills, generate student identity as scientists, and help make students part of a science community.

There is overwhelming research that shows implicit or unconscious bias exists and that it has a detrimental impact on employment and educational attainment of underrepresented and underserved groups. Manifestations of bias have been structural in nature, including barriers to work-life balance that affect women more than men, practices that favor male performance such as lecturing versus active learning, and images in institutions of higher learning. There is promise in addressing the prevalence of implicit bias in STEM through assisting mass media writers with depictions of science and scientists, such as STEM professionals and organizations partnering with the entertainment industry. Such partnerships can focus on promoting positive and diverse representations of STEM people and professions in popular media through engagement with advertising media community to raise awareness, and to seek commitments to change representations of STEM professionals in advertising. Such efforts are promising as there is strong evidence to show that interventions in media images can help to create social change, for example, with respect to the health problems associated with smoking and greater LGBT acceptance. To learn more about efforts to address implicit bias view Dr. Handelsman's at https://www.whitehouse.gov/sites/default/files/microsites/ostp/bias_9-14-15_final.pdf, co-authored with Dr. Natasha Sakreny, and the White House report on mitigating bias in STEM at https://www.whitehouse.gov/sites/default/files/microsites/ostp/ostp-opm_bias_mitigation_report__20161129.pdf.

Massachusetts Institute of Technology

Cited by Judy Jackson, Ed.D.

Soliciting Student Feedback. At MIT, the school President met with student groups during the 2015–2016 academic year and asked, “What’s not working well for you here? What do you think MIT should/could do to build a better, more inclusive community?” The result was no fewer than 40 recommendations (with added recommendations from staff and alumni of color) that the administration is vetting and prioritizing for implementation. The request for recommendations was made in the context of the racial tensions and unrest that gripped the country during this time; however, this type of personal request from top university leadership for student feedback on particular topics could easily be replicated in other STEM environments.

For MIT, the result has been a constructive process engaging major stakeholders. In addition to recommendations made by the MIT Black Students’ Union (BSU), the Black Graduate Student Association (BGSA), and LGBTQ+ students and staff, several other groups contributed ideas, including the Black Alumni of MIT (BAMIT) and MIT staff.

Two ad hoc groups of administrators, faculty, staff, and students formed at MIT to advance progress on the recommendations: the Academic Council Working Group on Inclusion, and a Staff Alignment Group. On April 29, 2016, a progress report on the BSU and BGSA recommendations was given to the MIT community at the Diversity Forum Town Hall. A summary is given in *The Status of BSU and BGSA Recommendations*. To learn more, visit <http://diversity.mit.edu/activities>.

Texas A&M University

Cited by Magdalini Lagoudas

Supportive Communities for STEM Students: Access and Inclusion Program. In 2014, Texas A&M’s College of Engineering instituted an Access and Inclusion Program dedicated to promoting the success of students, both graduate and undergraduate, from underrepresented groups. The Access and Inclusion Program has many subcomponents dedicated to particular aspects of engineering education, including outreach, recruitment, retention and professional development. For example, the program focuses on the

outreach and recruitment of pre-college students by creating partnerships with Texas high schools under a program called Engineering Aggies Gaining Experience (ENGAGE). As well, the Access and Inclusion Program offers ENGAGE Summer Camp, ENGAGE Counselors Update, and ENGAGE Fall and Spring Invitationals. The program is focused on creating supportive communities and providing the needed infrastructure for undergraduate and graduate student success. Other program subcomponents are dedicated to particular areas such as retention of first-year engineering students through transitional academic/study skills workshops, weekly peer mentoring opportunities, and life skills workshops covering topics such as engagement and self-efficacy. Another subcomponent is designed to offer freshman an introduction to research, providing them a global experience with both cultural and research components and preparing them for future international and research opportunities through the College of Engineering. For the last two years, the Texas A&M College of Engineering has seen an increase of Hispanic, African American, and Native American students, from 19% in 2014 to 22% in 2016. To learn more about Access and Inclusion at Texas A&M College of Engineering visit <https://engineering.tamu.edu/programs/access-and-inclusion>.

Boston Museum of Science

Cited by Christine Reich, Ph.D.

Universal Design Principles and Accessibility Committee. The Museum of Science (MOS or the Museum) in Boston shows its commitment to the inclusion of people with disabilities and strives to create an environment that is inviting, engaging, and accessible for everyone in large part through the work of two internal bodies charged with addressing issues of accessibility. At the organization-wide level, the Museum has an accessibility committee composed of representatives from seven of the Museum's eight Divisions, including the chief operating officer and vice president of human resources. The committee is responsible for identifying and resolving programmatic and physical accessibility concerns across the institution, as well for educating staff and informing the local and museum communities about the Museum's efforts and offerings. As part of its educational mission, the committee has produced a "tips booklet" (http://missionstem.nasa.gov/docs/MOS_Tips_Booklet.pdf) based on materials developed by the Massachusetts State House's accessibility office. A physical copy of this booklet has been provided to every MOS staff member and an electronic copy is available on the Museum's intranet to assist staff in appropriately addressing accessibility issues. Both the State House and the Museum have made their materials available for adoption by other institutions without copyright.

Recognizing the importance of its exhibits both to the Museum's overall mission and to accessibility, the Museum has also set up a Universal Design for Exhibits Committee (UDEC), which is responsible for ensuring that the design of the Museum's exhibits follows principles of universal design (and compliance with Americans with Disabilities Act). With funding from the Institute of Museum and Library Services, UDEC has produced the Universal Design Plan (http://missionstem.nasa.gov/docs/MOS_Universal_Design_Plan.pdf), a manual to assist MOS exhibit teams as they design and develop exhibits. The Plan includes sections on process; overall exhibition, component, and label design; and evaluation. Each section leads with a broad question to guide new development and remind the reader why the issues covered are important. Also included is a checklist combining ADA requirements and accepted MOS best practices, illustrations of measurements, and an appendix of background readings. To accompany the Plan, UDEC has also produced a quick-reference poster (http://missionstem.nasa.gov/docs/MOS_UD_poster.pdf) showing key UD and ADA dimensions at a 1:1 scale, to illustrate by direct example the design standards that exhibits should follow. Smaller illustrations of other important specifications supplement the life-size information.

University of Nebraska at Omaha

Cited by Scott E. Tarry, Ph.D.

Welcoming Climates for Non-STEM Majors: WiSTEM Pro2. The University of Nebraska at Omaha (UNEO) strives to set a welcoming climate in STEM courses for non-majors. In the 2015–2016 academic year, female faculty and staff members organized the WiSTEM Pro2 organization at UNEO. WiSTEM stands for Women in Science, Technology, Engineering and Mathematics. Pro2 represents the PROMotion and PROfessional development goals of the organization. WiSTEM Pro2 is dedicated to the promotion of women in STEM through mentoring, continued dialogue, and professional development through collaboration across campus initiatives and engaging organizations. The group is open to all individuals at UNEO interested in advancing careers and leadership opportunities for women. The goals of the organization are: advocate for the advancement of women in STEM, continue professional development through mentoring and programming, increase retention of women faculty and staff, and improve job satisfaction. To learn more visit <http://www.unomaha.edu/wistem-professional-development/index.php>.



Practices from NASA's Grantee Compliance Reviews

The following practices have been compiled from among those identified during the course of NASA's recent civil rights compliance reviews of grantees to better ensure equal opportunity in NASA-funded programs regardless of race, color, national origin, gender, disability, or age. Each of the reviews was conducted pursuant to one of the grantee-related civil rights laws for which NASA has implementation and enforcement regulations:

- Title VI of the Civil Rights Act of 1964, prohibiting discrimination based on race, color, or national origin (including limited English proficiency) by recipients of Federal financial assistance;
- Title IX of the Education Amendments of 1972, prohibiting sex discrimination (including sexual harassment and sexual violence) by educational recipients of Federal financial assistance;
- Section 504 of the Rehabilitation Act of 1973, prohibiting disability discrimination by recipients of Federal financial assistance or in Federally conducted programs; and
- Age Discrimination Act of 1975, prohibiting age discrimination by recipients of Federal financial assistance.

Reports of the compliance reviews referenced may be accessed on the MissionSTEM site at:

<http://missionstem.nasa.gov/civil-rights-compliance-reports.html>. Additional grantee promising practices posted on the MissionSTEM site are accessible through the site's homepage at <http://missionstem.nasa.gov/promising-practices-nasa.html>.

Boston University Department of Physics

(Title IX Review)

Targeted Title IX and Gender Equity Efforts. The BU Equal Opportunity Office has established and trained Deputy Title IX Coordinators across the many schools and offices of the university, including Physics. BU distributes its pamphlet, “Have you Experienced Sexual Assault, Sexual Harassment, Stalking, or Domestic or Dating Violence?” in a variety of locations across campus and recently created a new Web site to provide information on Campus Safety and its revised Sexual Misconduct/Title IX Policy. These actions help increase awareness of such issues on campus. BU, unlike many institutions, has a formal, written policy on childbirth and accommodation for graduate students and ensuring that it is applicable to both male and female Ph.D. students. The physics department’s Pre-Majors Program, designed to interest underrepresented students in astronomy, and is an important education and recruiting tool for interesting women and minorities in majoring in astronomy. The Women in Science and Engineering (WISE) programs WISE@Warren and WISE-UP House specialty residences for women help encourage women to major in and stay in STEM fields at the undergraduate level.

California Science Center

(Title VI/LEP Compliance Review)

Bilingual/Multilingual Staff Recruitment and Involvement. The Science Center seeks bilingual English/Spanish or multilingual candidates for certain positions and routinely seeks candidate with these skills for a number of positions, particularly in the Guest Service area. In addition, the California Science Center Foundation has instituted a Language Button Program with “I speak...”cards worn by over 153 staff (currently) speaking eight languages. Importantly, the Foundation conducts training for the staff wearing the buttons. Information booths are located at the main entry points to the Science Center and at ticket desks marked with the international symbol “i”. They are usually staffed with persons wearing the “I speak...” buttons who can provide foreign language services.

Formal and Informal Education Related Activities. The Foundation’s education-related activities are best practices for incorporating LEP components and working closely with Limited English Proficiency (LEP)

stakeholders to realize increased access for language minorities to its programs and services. For example, the Los Angeles Unified School District (LAUSD) is a close partner with the Foundation as they operate the Charter School inside the CSC's facility. The Foundation has demonstrated other collaborative efforts with external partners, including Para Los Niños, for science education from preschool up to middle school. Para Los Niños, which serves the poorest areas of Los Angeles, also provides scholarship money for those students to come to summer camp at the CSC. The Foundation partnered with a local mosque for language services and assistance with the development of exhibit and program content. These programs include Outreach Programs, Community Youth Programs, Summer Camp, Big Lab Programs, and Professional Development of teachers. Several of these programs, such as the Family Science Program, are conducted in Spanish or bilingually, or provide language assistance.

Guest Services Language Assistance Log. Guest Services staff has recently initiated a language request log. For example, the log tracks each time a non-English visitor guide is requested at the Front Desk. The log tracks language assistance requests by language and is done in daily, weekly, and monthly intervals.

Innovative and Cost-Effective Mechanisms for Improving LEP Access. The Foundation has leveraged its partnerships with outside entities such as a neighboring mosque for Arabic language services and Para Los Niños and Spotlight Media for Spanish language services. Furthermore, the Foundation permits tour groups and other groups to bring in their own translation services and support is provided by the Foundation as appropriate. Numerous staff can provide instant language assistance in several languages in education, food services, guest services, and other areas. Staff with bilingual or multilingual skills are identified by "I speak..." cards inserted into or onto their identification (ID) badge holders. Guest Services will require bilingual or multilingual skills for new hires in certain positions that have frequent visitor contact.

Florida International University (FIU), Department of Earth and Environment (DEE)

(Age Discrimination Act Review)

Retention Related Efforts. The FIU Student Transfer and Transitional Services audits of incoming transfer students are geared toward providing the maximum number of credits possible and included granting credit for some work-life experiences and veterans' service. In addition, the University offered a free online webinar

presentation entitled, “Academic Advising for Student Retention and Persistence, Understanding and Addressing the needs of Adult Learners,” which was geared toward training advisors on ways to support the adult learner. Also, the University requires that students meet “Core Curriculum” requirements. At present, it does not appear that FIU or DEE set a limit on how long a student can take to complete an undergraduate or graduate degree. One professor noted that the goal is for graduate students to complete their master’s degree within six years and their Ph.D. in nine years. It appears that the University and DEE present a flexible model, which allows for alternative methods of meeting course requirements and a reasonable time within which to complete their programs. This too demonstrates a commitment to both traditionally and non-traditionally aged learners.

Waiver of SAT/ACT Scores for Transfer Students and Other Flexibilities. FIU does not require transfer students to submit SAT/ACT scores. This could assist non-traditionally aged learners, many of whom fall into this category, because it removes the reliance on SAT/ACT scores, which could otherwise serve to eliminate from consideration a disproportionate number of applicants. In addition, military personnel may petition for credit for military training, which may serve to lessen their course load and take years off of their forecasted program of study. Although the University requires that students meet all Core Curriculum Requirements in addition to meeting program requirements, it allows for transfer credits and credits with certain exams, e.g., Advanced Placement, Cambridge, and Excelsior. It appears that the University and DEE present a flexible model, which allows for alternative methods of meeting course requirements and a reasonable time within which to complete their programs.

The Franklin Institute

(Title VI/LEP Compliance Review)

Philadelphia Science Festival. One of the first celebrations of its kind in the country, the Philadelphia Science Festival (the PSF) is a 10-day celebration of science and technology in everyday places—parks, restaurants, bars, libraries, and museums. It asks Philadelphians to question the world around them and aims to inspire not only the next generation of scientists and engineers, but also create homegrown citizen scientists. More than 200 partners work together to produce the Festival, which has corporate sponsorship but is organized by the Institute. In advertising for 2015 PSF interns, the Institute sought bilingual Spanish/English candidates.

The Institute's community engagement staff stated that they are responsive to targeted communities through community science networks. One of the areas is Hunting Park, a predominately Hispanic neighborhood in North Philadelphia. The Hunting Park Science Center School classes include dual language (English/Spanish) classes at all grade levels. Advertising materials for PSF are in English and Spanish, and include a billboard in Spanish for Hunting Park.

Staff Services for Improving LEP Access. The Institute has leveraged its partnerships with outside entities such as a neighboring mosque for Arabic language services and Para Los Niños and Spotlight Media for Spanish language services. Furthermore, the Institute permits tour groups and other groups to bring in their own translation services, and support is provided by the Institute as appropriate. Numerous staff can provide instant language assistance in several languages in education, food services, guest services and other areas. Staff persons with bilingual or multilingual skills are identified by "I speak..." cards inserted into or onto their ID holders.

Morehead Planetarium and Science Center (MPSC)

(Section 504 Review)

Serving Children on the Autism Spectrum. During the NASA review team's visit to MPSC, staff highlighted for NASA their ability to serve the needs of children on the autism spectrum. MPSC attributes this to the low student-faculty ratio, its proactive approach to identifying needs early, and its ability to draw on resources from University of North Carolina's Office of Accessibility Resources & and Service (previously known as the Department of Disability Services). MPSC has become well known within the local autism community based on the successes of autistic children in its programs, and parents have commented that MPSC has been willing to successfully accept their children in its programs when other places have rejected them. These programs, which include some students who are low-functioning (i.e., unable to speak) on the autism spectrum, regularly include about 30–40 students who are higher functioning on the autism spectrum, including those with Asperger Syndrome.

MPSC staff members attribute their success in this area to their proactive approach that focuses on identifying needs ahead of time and tailoring resources to meet these needs. Specifically, they have worked with parents to identify helpful strategies (such as providing one-on-one educators, quiet or "time-out" areas, private listening

headphones, or rearranged age groups). Most recently, they have brought in a teacher with many years of experience working with children on the autism spectrum to provide a training module for MPSC staff specific for meeting the needs of autistic students. The feedback on the on-site programming is generally very positive and the only notable concern is the availability of general parking (not limited to accessible parking). MPSC now tracks such feedback.

Portland State University (PSU) College of Liberal Arts and Sciences

(Age Discrimination Act Review)

Commitment to Students with Children and other Non-Traditional Students. The University demonstrates its commitment to all students and makes a substantial effort with respect to non-traditionally aged students by providing a broad range of information and services online and outside traditional business hours. PSU offers a variety of services to students with children, including all services described herein, as well as a family commencement, where children are invited to cross the stage with the graduating parent. PSU also displays a commitment to the non-traditionally aged learner through its implementation of student-fee-funded groups such as the Veterans' Resource Center.

Complaint Forms and Process Flowchart. PSU has a simple complaint form, whether for age discrimination or other grievance, and has made it available online, for walk-up, or phone-in completion. It also has set forth a flowchart outlining the complaints process, which is clear and easy for stakeholders to understand.

South Dakota School of Mines and Technology (SDSMT) Department of Geology and Geological Engineering (GGE)

(Title IX Review)

Institution-wide Title IX Self-Evaluation. The SDSMT Title IX Coordinator reports that the University is developing an institution-wide Title IX Self-Evaluation utilizing NASA's technical assistance document "A Guide for Conducting Title IX Self-Evaluations in STEM." Such an evaluation, in addition to the data collected in NASA's Title IX survey, and the statistical data on the GGE program gathered for NASA by SDSMT and analyzed below, constitutes an excellent effort to address gender equity issues at SDSMT.

Specific Outreach and Online Images of Gender Diversity. SDSMT hosts a “Go Women” breakfast at each of its Go to Mines recruitment events. This is an opportunity to connect prospective female students with current female students, faculty, and staff. The University and GGE also undertake intentional efforts to include images of both male and female students in their visual images on a regular basis.

Title IX Training for Search Committees. SDSMT requires all faculty and staff who will be serving on search and screening committees or who have hiring authority to complete a two-hour course on best hiring practices. This includes a discussion on discrimination and biases, as well as correct hiring procedures.

St. Louis Science Center

(Section 504 Review)

Accommodations for Visitors on the Autism Spectrum. To accommodate the needs of visitors on the autism spectrum, the Center has also recently started opening its new special exhibits venue (Boeing Hall) early for special “low-sensory” days. This allows visitors with disabilities to enjoy the special exhibits with a minimal stress and external stimulation.

Accommodations in Wayfinding for Visually Impaired Visitors. The Center has also experimented with different wayfinding technologies. For instance, the Center has a braille map of its facility, and visitor services occasionally chaperones people with disabilities to relevant destinations within its facility. The Center is also exploring the use of iBeacons, to track users. This wireless technology “announces” features within a short region of the device and enables the Center’s Research and Evaluation Department to better understand visitor interaction with different elements at the Center.

Comment Card Program. The Center also encourages good program access through the use of its comment cards. While these comment cards are inadequate as part of a Section 504 grievance process, the manner in which the Center uses the comment cards suggests that the Center is proactively reaching out to the public through the comment card program, anticipating the needs and interests of its visitors. Comment cards are distributed directly to visitors and returned to the Research and Evaluation Department for tabulation and analysis.

Outreach and Partnership in YES. The Center operates a YES (“Youth Exploring Science”) program for high school students 14 years and older, with 175 youth currently enrolled in the program. YES students learn science as a way to develop skills for college and life. During their first year, YES students learn basic skills and specific science-related information. After their first year, students spend 20 hours a weeks during their first summer leading the Center’s Summertime Science program, a multi-week science camp for younger students. Throughout their later years in the YES program, students work four hours a week in the school year and 20 hours a week in the summer in community internships.

Planetarium Accessibility for Visitors with Visual Impairments. In 1986, the planetarium created a program focused on young children and fosters an early interest in science. Over 60 planetariums worldwide now feature the show and it has been translated into several languages. In 2008, it was reproduced as a full-dome digital planetarium show and is available in both the 4:3 standard format and in full-dome. In 2011, the Center adapted The Little Star that Could toward students who are blind and low-vision. A large part of the original presentation used colors to represent different temperatures of stars. The Center created plush models of stars, using different fabrics with different textures (e.g. denim, velvet, etc.) to represent the same information conveyed by colors. It filled the model stars with rice that could be heated in the microwave. This program was an immediate hit and has developed into an accessibility program funded by the Lighthouse for the Blind. The program now incorporates iPads to stream the presentation to low-vision students. The next grant from the Lighthouse for the Blind will include braille guides for the planetarium and directional beacons, with a goal of expanding throughout the Center. Part of the grant also includes obtaining braille and large-print printers. These printers were primarily designated for use by the planetarium, but they will be used increasingly to improve program access in other areas of the Center and even by other organizations in the St. Louis Zoo Museum District.

Service Animals. The information gathered during the course of the NASA review suggests that the Center has little difficulty accommodating the needs of visitors with service animals. At one time, the Center may have worked with a service dog organization and, in general, they do not question visitors who bring animals if that animal has any indicia of possibly being a service animal. They only turn away people who try to bring their pets inside the Center or Planetarium.

Tactile Model of the Planetarium: The Center has also created a fully tactile model of the planetarium used as part of its tours of the facility. While the planetarium itself is relatively accessible, the unusual shape and size is difficult to describe verbally. The planetarium found that a physical model that could be touched enables a much clearer explanation to some audiences. While this tactile model was originally intended to help audiences

who are blind and low-vision, the planetarium has found that this model is particularly helpful for visitors with Autism Spectrum Disorder. In one instance, a nonverbal child became so excited by the exhibit that he started to describe the display to other people.

“White Glove” Tours. To improve program access for children with disabilities, the Center also offers “White Glove” Tours, enabling participants to touch select exhibits that are behind display cases. After the onsite review, the Center informed NASA that due to the new casework around the capsules as of 2015, a tactile 1:10 scale model of each capsule was created including Americans with Disabilities Act (ADA)-approved large-print text and braille descriptors. This enables children who are visually impaired, or who have other disabilities where touch would meaningfully augment their experience, to engage with an exhibit and ignite an interest in science.

Texas A&M University Department of Atmospheric Sciences (ATMO)

(Title IX Review)

Information Dissemination. Texas A&M is doing an excellent job of communicating information on Title IX within the ATMO program environment. At the time of NASA’s visit, “Know Your Title IX” posters were everywhere in the ATMO Department program environment, from message boards to stall doors in both the men’s and women’s restrooms. The ubiquitous nature of this messaging shows a strong effort on the part of the University, particularly its Title IX compliance officials, to “get the word out” and NASA commends the university for its actions in this regard. Such efforts can truly help those protected by the law to learn more about the rights it affords, and use that information should the need arise.

Self-Evaluation Efforts. Texas A&M’s Title IX self-evaluation efforts, including its Phase I Report and the data collected in NASA’s Title IX survey, as well as the statistical data on the Atmospheric Sciences program gathered for NASA by Texas A&M and analyzed below, provide an excellent start to Texas A&M’s Title IX self-evaluation efforts in the academic context.

- a. Student Outreach and Recruitment. Texas A&M and the College’s high school recruitment programs Aggieland Saturday, iGeo, and GeoX appear to be effective in sparking interest in Texas high school students, including female students, to attend Texas A&M and become Meteorology majors. Several students interviewed by NASA stated that these programs led them to choose Texas A&M over other schools because they felt more welcome at Texas A&M.

- b. Faculty Retention. ATMO makes significant efforts to retain female faculty members. For example, when the department was informed that another university was interested in hiring one of its 25 female faculty members, the department and College worked proactively to retain the faculty member. The retention effort included a salary increase and research support (via support for graduate research assistants) provided by the College and the department. With the retention effort, the faculty member decided to stay. The department has also worked to ensure family-friendly workloads where possible, especially for female faculty returning from maternity leave.

Well-Articulated Organizational Scheme Underpinning Title IX Efforts. Texas A&M employs a Director, Office of Equal Opportunity and Diversity (OEOD) at the A&M System level whose role is to coordinate the Title IX efforts of the University's multi-campus structure. Essentially, the Director, OEOD, oversees the work of the Title IX Coordinator and Deputy Title IX Coordinators at each campus, a "Coordinator of Coordinators," so to speak. As such, the Director, OEOD has responsibility for ensuring each campus is performing its Title IX responsibilities optimally. This pyramid structure enables Texas A&M to ensure uniformity and quality control in Title IX compliance efforts across its multi-campus structure, and to better facilitate cross-pollination of best practices. NASA found that with a well-articulated organizational structure underpinning its Title IX efforts, Texas A&M is exceptionally efficient and generally proactive in meeting its Title IX obligations. From a practical standpoint, Texas A&M greatly increases the likelihood that students will be aware of the University's Title IX Coordinators because the role is not limited to a single individual.

Women's Resource Center. NASA commends Texas A&M for its Women's Resource Center, which the University describes as striving to enhance the campus climate for women through visibility, advocacy, support, and programming. The Center serves as a symbol for the university's commitment to inclusion and equal access for women faculty, staff, and students, celebrating the achievements of women while calling attention to and challenging the barriers that can inhibit the full inclusion of women in the A&M community and beyond. The Center provides a wide array of trainings and presentations on topical issues such as sexual assault awareness, bystander intervention training and Sexual Harassment and Rape Prevention (SHARP) classes. In 2013, the WRC dedicated its Women's Leadership Forum to the theme of "Women Inspiring Innovation Through Imagination: Celebrating Women in Science, Technology, Engineering, and Mathematics" (<http://studentlife.tamu.edu/wrc>).

Many ATMO women graduate students are part of Earth Science Women's Network (ESWN), which is used for networking and finding potential jobs. The Texas A&M chapter of the American Meteorological Society and National Weather Association (TAMSCAMS) is the primary student organization involving students in the Meteorology curriculum in the ATMO Department. A leadership and enrichment opportunity for all, TAMSCAMS has particularly provided young women with professional opportunities. For example, three of the past five Presidents have been female, with similar representation among all of the officer positions. Two of the last three leaders of the Broadcasting group have been female.

University of Central Florida (UCF) Department of Physics

(Title IX Review)

COMPASS Program. This program, which is in its third year, is a National Science Foundation (NSF)-funded program whose mission is to increase the number of UCF students pursuing a discipline. COMPASS is built on 4 pillars: (1) undergraduate student success in STEM; (2) kindergarten through 12th grade (K-12) outreach; (3) faculty collaboration to work on STEM education and education research (ideally to increase proposals and funding); and (4) training and retraining of K-12 teachers (a long-term goal). Also, NASA notes UCF's EXCEL program, which has a primary goal of retaining students in STEM. EXCEL participants are graduating at higher percentages than non-participants, with improved math scores. UCF has found that EXCEL student data shows similar increases in student improvement for women and even higher increases for Hispanic and African American students. The university found that, although it was retaining women in EXCEL, it was retaining women at a lower percentage than men. UCF started looking at ways to improve the 15% or so gap, and found women were not feeling engaged in the community, as well as not feeling supported. To address these issues, UCF started the women's mentoring program, which focuses on female juniors and seniors mentoring incoming freshmen. With the mentoring program, the gap has narrowed to about 5%. The university finds that women really want support from one another.

Coordination between Faculty and Student-Centered Efforts. Naming the student rights and responsibilities director as Deputy Title IX Coordinator is an excellent means of linking the position that handles Title IX issues where a student is the alleged harasser with the position that handles allegations against faculty and staff. This helps to facilitate the needed coordination and collaboration.

Physics Program Rooms. Created by the previous chair, there are meeting rooms for undergraduate and graduate students in the Physics Department. The undergraduate room holds about 20 people and, according to undergraduate students interviewed, has become an important aspect of the undergraduate physics experience for many students. The room is a place where study groups meet and where students meet informally to discuss course work and collaborate on assignments. It is open and occupied 24 hours a day, 7 days a week. While by no means unique, UCF's Physics Program Rooms appear to exemplify the kind of collaborative atmosphere needed to combat the "chilly climate" that prevents so many physics programs from being welcoming and inclusive environments for diverse student bodies. The department is creating a second graduate teaching assistant room.

Studio Model/Learning Assistants Program. This is an excellent way to address the need for a more welcoming environment in the undergraduate physics classroom, based on a collaborative, peer-learning model. The performance evaluation for the program includes analysis of outcomes by gender. This program is currently run by a junior female faculty member and the previous chair. Participation is reasonably gender balanced, considering most physics students are male.

University of Minnesota (UMN) Department of Aerospace Engineering and Mechanics

(Title IX Review)

Campus Safety. Numerous safety services and resources are available to all University of Minnesota students, faculty, and staff. In addition to regularly running campus shuttles, Gopher Chauffer is a free transportation service offered from 10 p.m.–2 a.m. on Fridays and Saturdays, providing a safe ride home to all locations on campus and many locations near campus. A 24-hour security escort service also is available to and from campus locations and adjacent neighborhoods. Security monitors are trained in first aid, CPR, and body substance isolation and are equipped with a first aid kit and a portable police radio.

The UMN Police Department employs bicycle patrol, a canine unit, motorcycle patrol, and mounted patrol units. The university distributes crime alerts via e-mail to students, faculty, and staff, and disseminates critical campus safety information via the campus emergency notification text messaging service, TXT-U. Across campus, there are 20 Code Blue Phones, which provide an immediate connection to a 911 operator and 200 yellow

phones, which can be used for emergency, medical, or safety related calls. In addition, there are 2,300 security cameras across campus. These cameras are actively monitored by the university's 911-dispatch center. UMN also operates the "Step Up Campaign," which is designed to increase awareness about safety and evaluating potentially dangerous situations. This campaign has two primary focuses: preventing crime (including sexual assault) and preventing high-risk drinking.

Equal Opportunity (EO) Liaisons to Academic Units. UMN embeds EO liaisons in the university's various academic units and colleges, which is an excellent means for helping to disseminate key information, policies and procedures, on a regular basis. They also serve as easily accessible resources for reporting allegations of discrimination or harassment. This helps to more effectively institutionalize EO efforts by better positioning those with EO roles and responsibilities to both serve as conduits for and recipients of critical information from the various organizations that comprise the institution as a whole.

University of Washington (UW) Department of Atmospheric Sciences

(Title IX Review)

Information on Sexual Harassment. The university's Health and Wellness Web page on sexual harassment (<http://depts.washington.edu/livewell/sexual-harassment>) provides information on the types of sexual harassment and how to get help if one has been sexually harassed. The page also explains that sexual harassment is a form of sex discrimination under Title IX and provides links to the Title IX Compliance Support Program.

Task Force on Sexual Assault Prevention and Response. The university's task force on sexual assault prevention made several positive changes regarding campus culture and availability of information.

Washington University in St. Louis (WUSTL) Department of Physics

(Title IX Review)

Commitment to Policy, Education and Awareness on Sexual Harassment and Sexual Violence. In addition to its policy on sexual harassment, WUSTL has a separate policy statement, "Sexual Assault and Acquaintance

Rape.” This policy reaffirms the university’s commitment to a campus environment free from sexual misconduct of any kind. It also provides a wealth of information and available resources, such as “Campus Safety and Medical Assistance,” “Counseling,” and “Advice, Support and Education.” In addition, WUSTL updated its Policy on Sexual Harassment following the April 2011 “Dear Colleague Letter” to expand its definition of “sexual harassment” to include “sexual violence.”

In light of April 2011 “Dear Colleague Letter,” WUSTL aggressively communicated the policy across the university, while reinforcing its commitment to providing a safe environment, its responsibilities to stop and prevent recurrence of sexual harassment, and, to the extent harassment is found to have occurred, to remedy the effects of harassment on the victim and the university community. The HR office reached out to key administrators at the University regarding the policy, including but not limited to, ongoing presentations to deans and department chairs in the various Schools at the university. In addition, presentations on WUSTL’s policy on sexual harassment and Title IX were given over the past two years to the Title IX Task Force, all staff members of Campus Life and the Office of Student Involvement and Leadership (which includes Greek Life), all directors within “Student Services” departments on campus, residential college directors, residential advisors and Greek life house managers, its Campus Assessment, Response and Evaluation (CARE) Team, and the University Sexual Assault Response Team. In April 2011, the university adopted and held its first training session for a national bystander intervention program titled “Green Dot,” which is designed to promote use of peer influence to prevent sexual violence, intimate partner violence, and stalking violence on college campuses. Since that time, more than 100 students have been trained in bystander intervention.

Intentional Focus on Societal Impacts in Course Curricula. Several physics department professors and lecturers spoke about their efforts to imbue course work with societally relevant applications of the work. One physics teacher spoke about conscious efforts in this regard, for example, teaching or conducting lab work on the physics of how a bicycle operates, or teaching optics by focusing on how a telescope works. This is an important aspect of STEM teaching, particularly in the more theoretical fields, and particularly in freshman and sophomore environment, because it can help to retain a more broadly diverse, including gender diverse, student body.

Title IX Task Force. The WUSTL Title IX Task Force reviewed and amended policies and procedures related to sexual harassment and discrimination. The Task Force also has focused a good deal various on efforts related to educating the university community about sexual harassment and assault and ensuring that the University

has a safe and respectful environment for students, faculty, staff, and visitors. WUSTL gathered information by target audience, and has now formed sub-committees, specific to target audiences, with the charge of:

- Determining if the current efforts should continue, be modified, eliminated and replaced (it is critical that we not just add more programs/communications);
- Reviewing/evaluating the current education/training and outreach; and
- Making recommendations to the greater Title IX Task Force. In general, the committees are to consider, among other things, the types of communication, how formal and/or structured the communications are, timing of the communications and programs, etc. While the method or approach may vary by audience, it is WUSTL's objective that the programs be uniform in message and clear about the University's policy, expectations, definitions and responsibilities and resources.

Undergraduate Recruitment Efforts. The Department collaborates with the university's Office of Admissions to send several thousand personal mailings each year to all prospective students who have indicated any interest in physics as a potential major. The mailing includes an eight-page brochure that highlights personal experiences of recent students; half of the highlighted students are women. In addition, all female students are flagged for continued communication and personal introduction to the department upon acceptance to the university. The physics department Web site includes female students in its graphics. The main graduate page includes a statement of the department's commitment to diversity and "encourage[s] the application of women and under-represented minorities to our graduate and undergraduate programs, as well as for faculty and staff openings."

Conclusion

The promising practices in this document are just a small sampling of the many efforts nationwide that show strong civil rights compliance action, such as targeted outreach and recruitment, broad dissemination of key information, and intentional focus on education and awareness, can assist formal and informal educational institutions to address issues of diversity and inclusion in STEM. NASA's ongoing efforts to serve as a change agent in this arena will continue to emphasize the sharing of information and technical assistance to our grantees as we work together to make sure that the STEM fields continue to become more inclusive and to look more like the population of America in the 21st century.





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